

Section 1: Introduction, Proposed Goals and Institutional Process

I. Introduction

Energy is essential to the quality of life of every New Jersey resident. Secure and reasonably priced energy supplies and services are necessary for continued economic growth and development but must be procured in ways that protect the health and safety of residents and the state's natural environment. Residents, businesses, and other organizations depend on electricity, used for lighting and operating appliances and equipment. Electricity is generated using primarily nuclear, coal, and natural gas. New Jersey also depends on natural gas, which heats homes and buildings and is used in some manufacturing facilities. Finally oil is necessary to fuel transportation and provide heat. Energy policymakers at the Board of Public Utilities (BPU) are responsible for regulating a portion of the energy industry, namely investor-owned utilities in New Jersey that provide some energy services. Other energy sources, such as petroleum, are supplied through competitive markets not subject to economic regulation. Thus, the state's energy policy encompasses much more than just the regulation of investor-owned utilities.

Thinking about and planning for New Jersey's energy future is a critical task and should be a top priority of New Jersey's government. Leadership and commitment is necessary from the Governor's office to ensure that the agencies whose policy agendas intersect with the state's energy goals have developed an Energy Master Plan (EMP). These agencies are the BPU, the Departments of Community Affairs, Environmental Protection, Health and Senior Services, Human Services, Transportation, and Treasury.

II. The Statutory and Policy Context of State Energy Master Planning

Since 1977, New Jersey has been statutorily required to develop and maintain an Energy Master Plan. In 1987 the law was amended to mandate that a standing committee be created representing the interests of all relevant state policymaking agencies to act as the guiding force behind the energy planning process. This cross-agency design reflects the impact energy has on other agencies and policies in addition to the BPU and the utilities it regulates. Pursuant to the statute, an Energy Master Plan should be published every ten years and updated every three years thereafter. The statutory framework for the Energy Master Plan spans a period of ten years, providing a foundation for subsequent plans. Several plans have been promulgated since 1977, but the style and method of implementation has varied with changes in the political and regulatory environment. The most recent comprehensive Energy Master Plan was published in 1991. Another version was issued in 1995, responding to the introduction of wholesale competitive electricity markets in the region.

The scope of energy policy at the national level is broader than at the state level, although their goals are not mutually exclusive. For example, whereas the federal government pursues energy independence to limit the economic consequences of oil price shocks and to mitigate energy-related geopolitical conflict, the pursuit of energy independence at the

state level is less practical. New Jersey can support the goals of the federal government in its Energy Master Plan, while still focusing on the realm of issues and the levers of influence most pertinent to state governments.

Designing energy policy to influence the energy future of New Jersey is a serious challenge. The ever-changing energy landscape requires an adaptive approach to achieve the long-term vision for the state. Policymakers must assess various energy futures and account for the social costs and benefits of their choices. Energy has become integrated into the economy and daily life precisely because it has been made accessible to us through intense investments in production and delivery infrastructure. The real costs associated with maintaining the current system, or the costs of investing in an energy infrastructure based more on renewable energy or other advanced efficiency technologies, are substantial. Despite this changing landscape and the difficulty of assessing different energy strategies, the state must have clearly articulated goals and objectives so that it can formulate its policies and direct its resources toward implementing a strategy that will accomplish the desired results.

New Jersey has made a commitment to clean energy through its Renewable Portfolio Standard (RPS). An RPS requires that a certain percentage of electricity sold in the State be produced from renewable resources. New Jersey has divided renewable resources into two categories, Class 1 and Class 2, and places emphasis on Class 1 resources for the purpose of the RPS. This category includes solar photovoltaic (PV), solar thermal electric, wind, geothermal, fuel cells, landfill gas recovery, and sustainable biomass. Class 2 includes hydroelectric and waste-to-energy technologies. The goal for the RPS is to reach 6.5% by 2008 and 20% by 2020. This policy commitment significantly shapes the path of the Energy Master Plan.

III. EMP Goals, Objectives and Performance Measures

The three major goals defined in the 1977 Statue are energy security, economic growth, and environmental protection. For each of these goals, numerous specific objectives are proposed for consideration by the BPU in its development of its Straw EMP. The goals are broad in scope and touch on more than one energy sector and fuel type whereas the corresponding objectives support achieving a particular goal. The goals and objectives are listed below, and their rationales are set forth in subsequent chapters. Several objectives thematically repeat across goals.

This Straw EMP envisions identifying performance measures for each objective so that the State can monitor its progress in achieving its goals. Quantifiable performance measures are imperative to successful energy master plan implementation. As part of the inter-agency discussions, it is envisioned that agencies primarily responsible for specific objectives develop associated performance measures commensurate with those developed by the BPU.

It is also important to keep in mind the high-level objectives while working to meet specific targets. Therefore, the objectives listed here remain high-level in nature. This is

used to highlight some of the current trends in policy and technology that could be used to meet more than one goal for New Jersey. These trends and the objectives related to them will be drawn out and elaborated in the final chapter of this Energy Master Plan.

As defined in the original 1977 New Jersey Statute requiring the State to undergo an Energy Master Plan process, the goals of such a plan should address energy security, economic growth, and environmental impact. The following goals reflect these expectations:

Goal 1: Secure, Safe, and Reasonably Priced Energy Supplies and Services –

To provide safe, secure, reasonably priced energy supplies and services to New Jersey's commercial, industrial, transportation, and residential customers, while reducing dependence on traditional fossil fuels and fossil fuel generation, decreasing electric and natural gas transmission congestion, utilizing efficiency and renewable resources to supplement the State's energy resources, proactively planning for in-state electricity generation retirements, and reducing the demand for energy.

Goal 2: Economic Growth and Development – To encourage and maintain economic growth prospects for the State by recognizing and fostering the multiple functions of energy in the economy—as an integral part of producing and transporting goods and services; as a means of attracting business to the state with reliable, reasonably-priced energy; and as a potential driver of new areas of economic activity.

Goal 3: Environmental Protection and Impact – To promote the achievement of Federal and State environmental requirements and objectives in an effective and reasonable-cost manner, considering environmental and public health costs and, where appropriate, provide market-based incentives to achieve those goals. These policies should be coordinated with the State's environment, economic, and redevelopment plans to protect and enhance environmental quality, conserve natural resources, and improve the quality of life in New Jersey.

It is the desire of state policy makers in the interest of promoting a more secure, economic, and environmentally responsible energy future to articulate a single, overarching goal for New Jersey as it completes the Energy Master Plan:

Main Goal: Reduce projected energy use by 20% by 2020 and meet 20% of the State's electricity needs with Class 1 renewable energy sources by 2020. The combination of energy efficiency, conservation, and renewable energy resources, should allow New Jersey to meet any future increase in demand without increasing its reliance on non-renewable resources.

Focusing on clean energy resources—renewable resources, energy efficiency technology, and energy conservation—will increase the state's ability in the long run to deal with supply interruptions and volatile energy markets. Furthermore, this goal will meet the

state's commitment to environmental stewardship and bolster its ability to combat emissions of greenhouse gases, nitrogen oxides, volatile organic compounds, fine particulates, sulfur dioxide, air toxics, and other pollutants that contribute to environmental degradation and public health problems.

To achieve this goal will require aggressive and concerted efforts by key state agencies and commission, but also engagement by the citizens, businesses, and industries of New Jersey. The New Jersey Energy Master Plan is envisioned to be a defining planning document that will provide the foundation and path forward to reach this important goal.

IV. The Need for Institutionalizing the Energy Master Planning Process

Energy policy is one piece in a network of state policymaking, but energy supply and demand affect all aspects of State policymaking and society. The role of the Energy Master Plan is to coordinate energy policy among different agencies. A comprehensive energy plan addresses the many facets involved in sustaining the community, from community development, to environmental protection, to human services and transportation. It should have goals and objectives that transcend the goals of individual agencies. Without joint policymaking and coordination, progress made by one agency can be nullified by the incongruent actions of other agencies.

The purpose of the 1987 amendment to the Energy Master Plan statute requiring that a standing committee be convened to maintain a dialogue about energy policy in New Jersey was passed in recognition of the importance of interagency coordination. The reality of state policymaking is often that in spite of good intentions to follow-through, efforts to coordinate often break down in the day-to-day activities of these busy agencies. But the importance of rallying around the Energy Master Plan cannot be underscored enough, and therefore we set forth a number of key recommendations for institutionalizing the energy master planning process. These process recommendations are meant to provide a reasonable and realistic framework through which the New Jersey leadership can make progress in fulfilling the goals and objectives of the Energy Master Plan once the plan has been developed.

Recommendations:

1. Convene a working group that will meet semi-annually, comprised of leaders of the agencies working on the Energy Master Plan. The intention of the group is to track of the progress being made on the goals and objectives of the plan.
2. Create and maintain a viable energy and related infrastructure data center. This center will keep track of key infrastructure, such as pipelines, electrical wires, and electrical power plants, as well as roads, fueling stations, transit facilities, and other transportation-related energy infrastructure. The data center would include raw data and graphical data tools, such as up-to-date Geographic Information System (GIS) maps. The accessibility of quality data

is key to implementing the Energy Master Plan and for making modifications to the plan as necessary in the prescribed updates set to take place every three years. Appropriate confidentiality and security measures would be implemented.

3. Retain a full-time equivalent (FTE) BPU staff that is solely responsible for the maintenance and periodic updates to the Energy Master Plan. The BPU staff will coordinate with employees from all agencies represented on the Energy Master Plan committee and provided opportunities for involved staff to enhance their understanding of how energy plays a role in the missions of each key agency.

Energy sources, whether petroleum, natural gas, coal, electricity, nuclear, or renewable energy have various levels of integration with international, national, and regional markets, as well as regulatory and coordination agencies. Therefore, the Energy Master Planning process must integrate this reality into its planning.

4. Set up, as part of the Energy Master Planning staff or as additional tasks in the job descriptions of existing employees, a BPU liaison function (if not already established) designed to keep abreast of all relevant planning and regulatory events hosted by FERC, MAAC, PJM, RGGI, NRC, the U.S. Departments of Energy and Transportation, the Environmental Protection Agency, etc. and to send representatives to those events in order to facilitate a cross-fertilization of concerns New Jersey has with those of the agencies and organizations that affect energy policy in this State. The liaisons should provide reports to inform discussions at the semi-annual meetings of the agency heads, and on an ongoing basis to the Energy Master Planning staff.


The statutes governing the Energy Master Planning Process define the state agencies that participate in the process. These are: the Board of Public Utilities and the Departments of the Departments of Community Affairs, Environmental Protection, Health and Senior Services, Human Services, Transportation, and Treasury. These will continue to be relevant agencies for the Energy Master Plan and should be active participants in the entire process. Energy issues may reach beyond these agencies and the time may be ripe for considering a larger body of agencies to be represented on the Energy Master Planning Committee and reflected in the goals and objectives of the final product. Of particular relevance are agencies such as the Department of Education and the Commission on Higher Education that play a role in educating the citizenry of this State. Energy policymaking can also about informing the public about the costs associated with securing energy supplies and the benefits reaped from using energy every day. The Department of Labor and Workforce Development may also have a stake in helping design the energy future of New Jersey. The participation of these and other key agencies may be a crucial to institutionalizing this process.

5. Consider within the existing Energy Master Planning Committee if there are additional departments or agencies that could contribute to the writing and carrying out of the Energy Master Plan.

V. Understanding Energy's Complexity

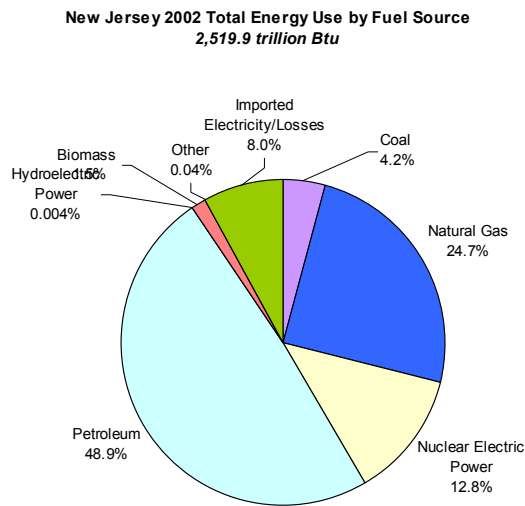
The Energy Master Plan examines the energy source reality within the electric power sector, natural gas, and petroleum sectors and analyzes the gap between current supply and future demand. New Jersey's commitment to renewable energy resources is also examined. While the state has made significant progress in promoting energy efficiency, conservation, and clean renewable resources such as solar, there will need to be more aggressive movement forward in order to meet the main goal of energy policy makers. However, the importance of energy security, which could be enhanced by more in-state generation, is underscored by the recent supply disruption experiences sparked by natural disaster and events overseas. The Energy Master Plan includes a section exploring these disruptions and the federal and state response to them with the aim to understand the planning environment within uncertain circumstances.

Table 1: Understanding the Interconnections between Primary and End Use Energy Sources

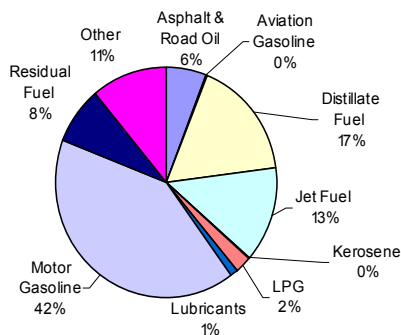
End Use Categories of Energy				
Primary Energy Source:	Electricity	Heat	Transportation	Origin of Primary Energy:
	Natural Gas	Natural Gas	Natural Gas	North America (Dry Natural Gas); various overseas countries (LNG)
	Coal	Petroleum	Petroleum	North America (Coal); Middle East, Canada, some Domestic
	Nuclear	Electricity		Domestic (Nuclear)
	Efficiency			Domestic
	Renewable Energy Resources			

Important to recognize is that energy sources, intermediate uses, and end uses of energy are far from straightforward. The three main “use categories” of energy are electricity, heating, and transportation. Electricity however, is a carrier of energy and not a primary source of energy itself. For heat and transportation applications primary energy sources may be used, but require refining, transportation, distribution and other processes that require energy use. Therefore, capturing the complex nature of energy use for the nation and for the state of New Jersey is a challenge. Table 1 and Figure 1 exemplify this complexity by showing how primary and end use energy sources relate to each other, and how total energy consumed by fuel type in New Jersey is further broken down within petroleum portion of that energy consumption as well as the electricity consumption.

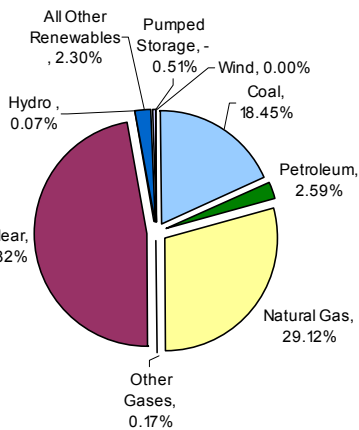
Figure 1: Energy Source and Use Landscape in New Jersey¹



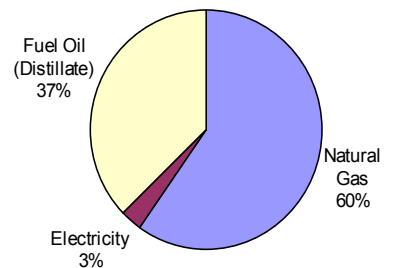
NJ 2002 Petroleum Use by Fuel Source²
(1,231.8 Trillion Btu)



NJ 2004 electric generation by Fuel Source³
(In-State & PJM)



2001 Space Heat Use by Energy Source⁴
(Mid-Atlantic Region)



While the Energy Master Plan examines electricity, natural gas, and petroleum in depth, it remains paramount to understand as Figure 1 illustrates that many energy sources and end uses are intertwined. To this end, making concerted policy efforts in energy

¹ Source: EIA State Energy Data 2002. These data include jet fuel and “other” in the petroleum category, and since some of the “other” category is not combusted for energy, but is instead used as feedstock for chemical syntheses, etc. and some of the jet fuel is used in New York this figure overstates New Jersey’s fuel use.

² Source: EIA, State Energy Data 2002

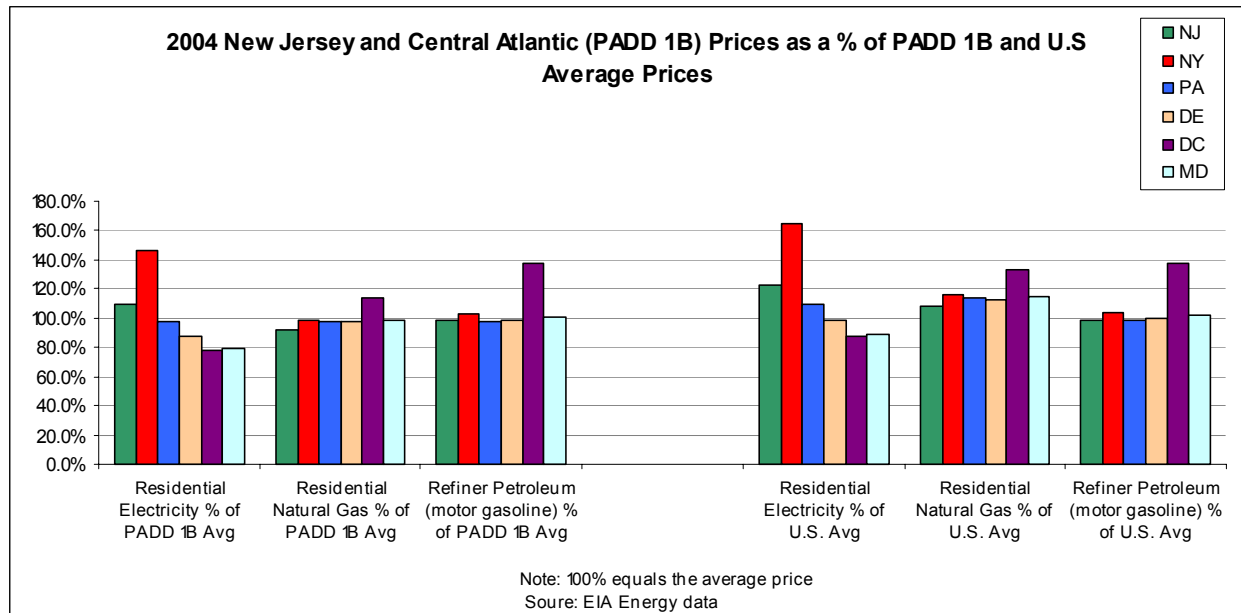
³ Source: EIA, State Energy Data 2004

⁴ Source: EIA, State Energy Data 2001; Mid-Atlantic ABSTRACT, 2001

conservation and efficiency—both of which are relevant policy tactics for all energy use categories—bridges some of the complexity in a single, statewide policymaking effort.

Important to note as well is that New Jersey is just one state in the Mid-Atlantic region and its energy choices now and in the future impact the other states and are impacted by the decisions in the other states. This is especially true in the area of economic development with respect to price stability. Figure 2 shows the prices faced by New Jersey as a percentage of the regional⁵ and national averages for the year 2004.

Figure 2:



⁵ Region refers to Petroleum Administration for Defense Districts (PADD) 1B states which include New York, New Jersey, Pennsylvania, Delaware, Maryland and District of Columbia.

⁶ Source: EIA State Energy Data 2002. These data include jet fuel and “other” in the petroleum category, and therefore overstate the quantity of fuel use in NJ. Some of the “other” category is not combusted for energy, but is instead used as feedstock for chemical syntheses, etc. and much of the jet fuel is not used in-state